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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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01/29/2007

Dane Cubric

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EXAMINER

CHANG, HANWAY

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/569,963	Applicant(s) CUBRIC ET AL.	
	Examiner Hanway Chang	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/29/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mook et al. ("Construction and characterization of the fringe field...", Ultramicroscopy 81 (2000), pgs. 129-139, hereinafter Mook) in view of Kawanami et al. (US Pat. 5,065,03, hereinafter Kawanami).

Regarding claim 1, Fig. 1 of Mook discloses a monochromator filter assembly located after the particle source (Schottky source) and an aperture plate (nanoslit) containing at least one aperture for shaping the particle beam (see pgs. 129-130, second to last line to end of paragraph). Mook does not teach that the aperture plate is located between the particle source (Schottky source) and the monochromator filter assembly. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the monochromator filter assembly and the aperture plate, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Further regarding claim 1, Mook further does not disclose that the aperture plate is characterized in that the aperture plate is adjustable with respect to the monochromator filter assembly during normal operation of the apparatus so that the

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size of the aperture for shaping the particle beam can be varied. However, in the same field of endeavor, Figs. 3a-3b of Kawanami disclose the aperture plate (11a-11b) is adjusted so the size of the aperture for shaping the particle beam can be varied (see col. 2, lines 13-33). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Mook by having the aperture plate be adjustable for the purpose of controlling the shape of the beam.

Regarding claim 2, Fig. 4 of Mook discloses the aperture plate (nanoslit) contains two or more apertures of different sizes (see pgs. 132-133, last paragraph to the end of the paragraph).

Regarding claim 3, Figs. 2 and 4 of Mook disclose the aperture plate has more than one aperture and is displaceable relative to the monochromator filter to selectively align the aperture with the beam (see pg. 133, lines 3 to end of paragraph).

Regarding claim 4, a difference between Mook and the claimed invention is the aperture plate is formed from two or more partial plates. However, in the same field of endeavor, Figs. 3a-3b of Kawanami discloses that the aperture plate is formed of two partial plates (11a and 11b) (see col. 2, lines 13-20). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to have two or more partial plate for the purpose of controlling the shape of the aperture.

Regarding claim 5, a difference between Mook and the claimed invention is the partial plates co-operate to provide an aperture of variable size. However, in the same field of endeavor, Figs. 3a-3b of Kawanami discloses the partial plates (11a and 11b) co-operate to provide an aperture of variable size (14) (see col. 2, lines 13-24). In view

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of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to have partial plates co-operate to provide an aperture of variable size for the purpose of controlling the shape of the beam.

Regarding claim 6, a difference between Mook and the claimed invention is the partial plates can move towards or away from the center of the aperture to vary the size of the aperture. However, in the same field of endeavor, Figs. 3a-3b of Kawanami discloses the partial plates (11a and 11b) move towards or away from the center of the aperture (along the axis 12a and 12b, respectively) to vary the size of the aperture (see col. 2, lines 25-33). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to move the partial plates towards or away from the center of the aperture to vary the size for the purpose of controlling the shape of the beam.

Regarding claim 7, a difference between Mook and the claimed invention is the aperture plate is adjustable using mechanical control means. However, in the same field of endeavor, Figs. 3a-3b of Kawanami discloses that the aperture plates (11a and 11b) are adjusted using mechanical control means along axes 12a and 12b, respectively (see col. 2, lines 25-33). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to adjust the aperture plate using mechanical control means for the purpose of controlling the shape of the beam.

Regarding claim 8, Mook does not explicitly disclose that the mechanical control means incorporates a section made from electrically insulating material. However, it would have been obvious at the time of invention to a person of ordinary skill in the art

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to have electrically insulating materials for the purpose of not being influenced by the charged particle beam during operation.

Regarding claim 9, Mook discloses a known electrically insulating material is aluminum oxide (see pg. 131, col. 1-2, last 3 lines to end of paragraph). It would have been obvious at the time of invention to a person of ordinary skill in the art to use aluminum oxide for the purpose of the control means is not being influenced by the charged particle beam during operation.

Regarding claim 10, a difference between Mook and the claimed invention is the aperture plate is adjustable using electronic control means. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to use electronic control means for the purpose of having greater control over the precise movements of the aperture plate.

Regarding claim 15, Fig. 1 of Mook discloses a particle gun comprising the particle source (Schottky Source) and a gun lens (Gun) located after the particle source for focusing the beam (see pg. 130, col. 1, last paragraph to end of paragraph). Mook does not disclose the aperture plate being located between the gun lens and the monochromator filter assembly. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have the aperture plate be located between the gun lens and the monochromator filter assembly, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 16, Fig. 1 of Mook discloses a particle gun comprising the particle source (Schottky source) and a gun lens (Gun) located after the particle source for focusing the beam (see pg. 130, col. 1, last paragraph to end of paragraph). Mook does not disclose the aperture plate being located between the particle source and the gun lens. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have the aperture plate be located between the particle source and the gun lens, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 17, Fig. 1 of Mook discloses that the monochromator filter assembly is a Wien filter (see pg. 130, col. 1, lines 19-21).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mook in view of Kawanami as applied to claim 10 above, and further in view of Brakenhoff (US Pat. 4,880,294, hereinafter Brakenhoff).

Regarding claim 11, a difference between Mook and the claimed invention is the electronic control means is a piezoelectric control means. However, in the same field of endeavor, Brakenhoff teaches that piezoelectric control means are commonly used because of accurate adjustability over small distances (see col. 2, lines 50-68). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to use piezoelectric control means for the purpose of accurately adjusting the aperture plates as taught by Brakenhoff.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mook in view of Kawanami as applied to claim 1 above, and further in view of Moriizumi (US Pat. 5,153,441, hereinafter Moriizumi).

Regarding claim 12, a difference between Mook and the claimed invention is the aperture plate is adjustable using means responsive to incident optical radiation. However, in the same field of endeavor, Moriizumi discloses the aperture plate is adjusted by means responsive to incident optical radiation (see col. 4, lines 3-17). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to adjust the aperture plate using means responsive to incident optical radiation for the purpose of exposing a different area when exposure is completed.

Regarding claim 14, a difference between Mook and the claimed invention is the means responsive to incident optical radiation is an electronic control means. However, the means responsive to incident optical radiation as disclosed by Moriizumi inherently must be an electronic control means. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to have a means responsive to incident optical radiation be an electronic control means for the purpose of exposing a different area when exposure is completed.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mook in view of Kawanami and in further view of Moriizumi as applied to claim 12 above, and further in view of Brittell (US Pat. 5,749,646, hereinafter Brittell).

Regarding claim 13, the combination above does not explicitly disclose that the means responsive to incident optical radiation is a bimetallic component. However, it is known that bimetallic components are used for response to incident optical radiation as shown in Brittell (see col. 1, lines 46-48). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Mook to use a bimetallic component for responsive incident optical radiation as taught by Brittell.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanway Chang whose telephone number is (571)270-5766. The examiner can normally be reached on Monday to Friday 7:30 AM till 4 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hanway Chang

May 27, 2009

/H. C./

Examiner, Art Unit 2881

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881